V. REMARKS

Claim 3 is rejected under 35 U.S.C. 112, second paragraph. Claim 3 is canceled and therefore the rejection as applied thereto is now moot. Withdrawal of the rejection is respectfully requested.

Claims 1, 3, 5, 7, 9, 23 and 24 are rejected under 35 U.S.C. 103(a) as unpatentable over Rood (U.S. Patent No. 4,715,733) and further in view of Tanishiki (U.S. Patent No. 5,846,000). The rejection is respectfully traversed.

First, the Examiner states that Rood discloses a thrust bearing arrangement in Figure 10 configured for orbital motion, the thrust bearing comprising a pair of opposing plates (20e, 22e), a track pocket (32) formed in the plates, and a plurality of both-end conical rollers (24a) disposed in the track pockets of the opposing plates. The Examiner also states that referring to Figure 10, Rood illustrates the relation of the scroll swirl radius and the dimension between opposite tracks of the bearing plates is set in a relation of $1<H/R<5$.

Applicants respectfully disagree with the Examiner's position mentioned above. While reasons therefore have been discussed in previous amendments, which are herein incorporated by reference, Applicants state the reasons again below.

An important structural feature recited in claim 24, specifically the feature that a relation of a scroll swirl radius (R) and a dimension (H) between opposite tracks of the bearing plates being set in a relation of $1<H/R<5$ is obtained as a result of various tests and studies by the applicants in order to solve the problems of the prior art.

That is, in the both-end conical rollers composing the scroll thrust bearing, by setting a relation of the scroll swirl radius (R) and a dimension (H) between opposite tracks of the both bearing plates is set in $1<H/R<5$ (concretely, see page 14, line 4 to page 15, -line 21 in the specification), it has been succeeded in extending substantially not only the life of the both-end conical rollers but also the life of the scroll thrust bearing.

More specifically, since the shape and dimension of the both-end conical rollers are designed to satisfy the above relation, with respect to the preset scroll swirl radius R of the both-end conical roller, the section curvature in the contact portion with the track

of the both bearing plates on the conical surface of the both-end conical roller is as small as possible in practical range. Therefore, the surface pressure (pressure per unit area) acting on the conical surf ace of the both-end conical roller is as small as possible, and a sufficient durability is assured practically.

As pointed out by the Examiner, at first sight, Rood seems to illustrate in Figure 10 that the relation of the scroll swirl radius and the dimension between opposite tracks of the bearing plates is set in a relation of $1<H/R<5$ as recited in claim 24. However, Rood not only does not disclose the present invention (i.e., all of the problems of the prior art to be solved by the present invention, the structural features of the present invention especially a relation of a scroll swirl radius (R) and a dimension (H) between opposite tracks of the bearing plates being set in a relation of $1<H/R<5$, and operation and effect of the present invention) , but also does not teach and suggest the present invention.

In other words, though Rood illustrates various both-end conical rollers having different configurations including both-end conical roller in Figure 10 pointed out by the Examiner, Rood does not describe the relation of a scroll swirl radius (R) and the dimension (H) between opposite tracks of the bearing plates concerning any both-end conical rollers at all. This fact shows with reality that in Rood there is no awareness of the problems of the prior art to be solvedby the present invention, and therefore there is no realization of the structural features of the present invention, too.

That is, the Examiner cites Rood as a main reference for rejecting the present claims for the reason that the relation of the scroll swirl radius (R) and the dimension (H) between opposite tracks of the bearing plates illustrated in Figure 10 of Rood accidentally happen to be within a relation formula $1< H/R <5$ recited in claim 24, in other words, for the reason that Figure 10 of Rood accidentally shows only a point of the present invention which has some technical extent as the technical idea.

However, this Examiner's position is not persuasive, therefore, the applicants strongly disagree with the Examiner's position.

Further, the Examiner states that Rood does not disclose the rollers having a crown, but Tanishiki discloses (column 11, lines 1-6) that the rollers can be formed with a crown. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to form the contact surface of each roller disclosed by Rood with a crown, as taught by Tanishiki, in order to reduce edge loading thereby increasing the operating life of the rollers.

However, Applicants respectfully disagree with this Examiner's position, too. That is, while as pointed out by the Examiner, Tanishiki surely refers to the conical faces of the double-cone roller as being provided with "crowning" in column 11, line 16, Tanishiki only suggests a possibility that the conical faces of the double-cone roller may be provided with crowning for the prevention of edge load, still less Tanishiki does not teach nor suggest combination of "crowning" and an important structural feature of the present invention mentioned above.

Therefore, the Examiner's position "it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the contact surface of each roller disclosed by Rood with a crown, as taught by Tanishiki,, in order to reduce edge loading thereby increasing the operating life of the rollers", by combining Rood;which only accidentally shows a structure being within a relation formula $1 < H/R < 5$ recited in claim 24, namely, merely accidentally shows only a point of the present invention having some technical extent as technical idea (so that in Rood there is no awareness of the problems of the prior art to be solved by the present invention, and therefore there is no realization of the structural features of the present invention, too.) and Tanishiki; which only suggests a possibility that the conical faces of the double-cone roller may be provided with crowning for the prevention of edge load, is irrelevant position, and the applicants, therefore, cannot physically accept the Examiner's position.

It is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests the features of claimed invention the reasons discussed above. Thus, it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine the features of the applied art because such combination would not result in the claimed invention. As a result, the pending, non-withdrawn claims are allowable over the applied art.

Claim 3 is canceled and therefore the rejection as applied thereto is now moot. Withdrawal of the rejection is respectfully requested.

Furthermore, applicants respectfully request rejoinder of claim 6 to the

application. Applicants would like to point out that claim 6 depends from claim 5 which depends from claim 1 which depends from claim 24.

In view of the foregoing, reconsideration of the application and allowance of the pending claims are respectfully requested. Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Should additional fees be necessary in connection with the filing of this paper or if a Petition for Extension of Time is required for timely acceptance of the same, the Commissioner is hereby authorized to charge Deposit Account No. 18-0013 for any such fees and Applicant(s) hereby petition for such extension of time.

Respectfully submitted,

Dated: October 6, 2003

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Enclosure(s): Petition for Extension of Time (two months)

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